Increase MP Performance

WITH PLATFORMS BASED ON THE DUAL-CORE
INTEL® XEON® PROCESSOR 7000 SEQUENCE

Introducing Intel's first multi-core CPU for the MP platform.

For enterprise computing, nothing less than four-way processor systems will do. And Intel is proud to announce the seventh-generation of MP processors, now featuring dual-core technology. The Dual-Core Intel® Xeon® processor 7000[1] sequence offers up to 60% projected performance increase over previous-generation single-core processors based on Intel initial preliminary testing,[2] while delivering expandability and outstanding reliability for mid-tier enterprise applications.

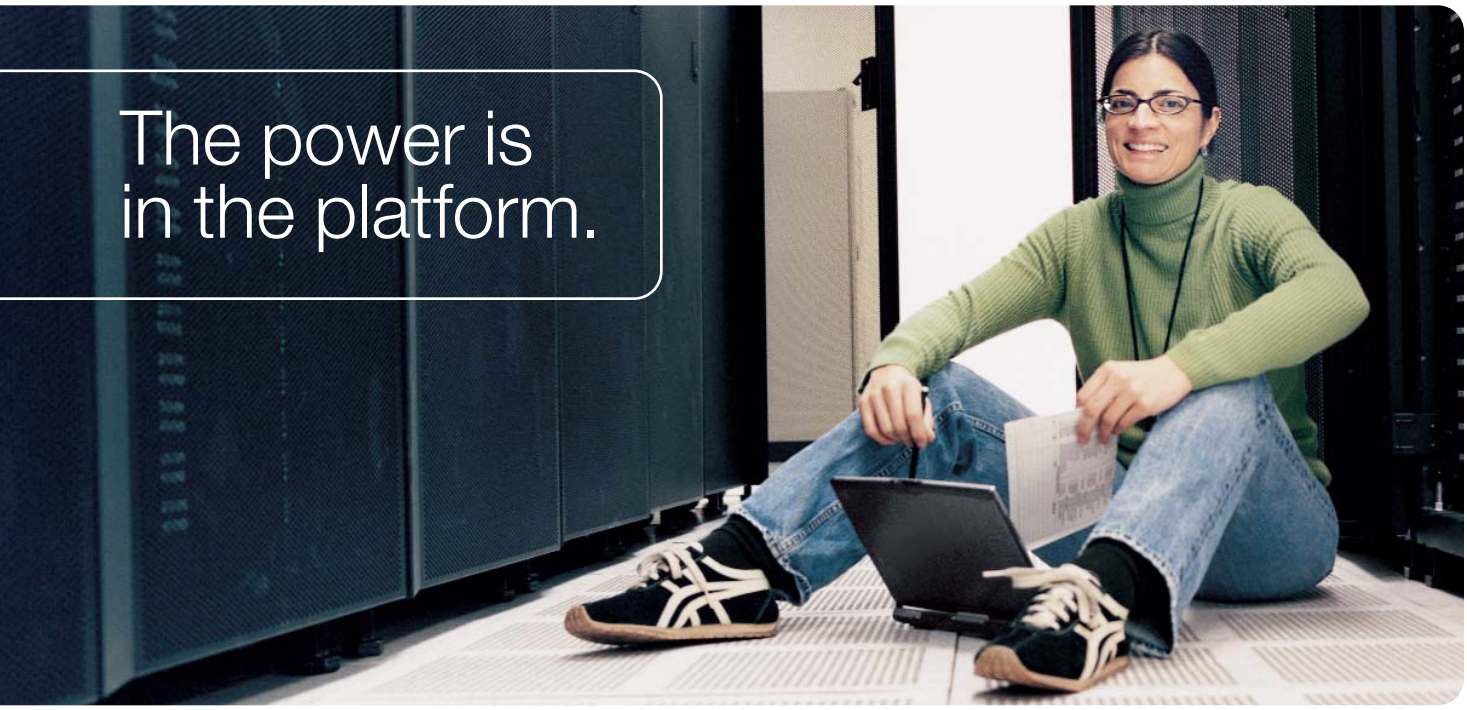
Each Dual-Core Intel Xeon processor 7000 sequence supports up to four tasks or software threads and can run both 64-bit and 32-bit applications. This makes an MP platform based on the Dual-Core Intel Xeon processor 7000 sequence ideal for supporting multiple, simultaneous transactions, and for consolidating numerous operating systems, applications, and workloads onto a single server.

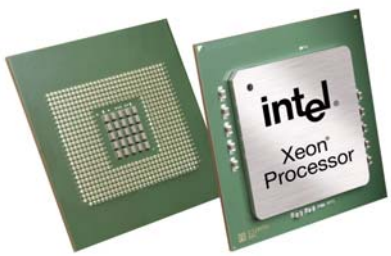
With Intel built in, your company has success built in.

To move forward, your business has to be agile—recreating itself daily to better compete in today's environment. Acting and reacting on the turn of a dime. Taking advantage of innovations at the same time you make the most of your existing technology investment.

That's just what server platforms based on Intel's multi-core technology let you do, help give you greater performance and responsiveness than previous-generation single-core server platforms and a foundation based on the industry's leading business computing architecture.

With nearly 30 million Intel® processor-based servers shipped since 1996, and a 10-year track record of delivering enterprise-class performance, you know you can count on Intel to deliver quality and reliability. And currently, with over six million 64-bit processors already shipped, you can depend on Dual-Core Intel Xeon processor-based servers to handle your 32-bit and 64-bit applications.





The chips in the Dual-Core Intel Xeon Processor 7000 sequence are based on Intel's 90 nm wafer fabrication process. They benefit from Intel's dual-core technology, which helps increase compute power and throughput by 60% projected performance increase over previous-generation single-core processors based on Intel initial preliminary testing.[2]

This means they can handle large peak demands and help increase your return on investment. And they deliver outstanding performance for 32-bit software and increased headroom for 64-bit applications, running both simultaneously. The result? An investment that helps lower your Total Cost of Ownership (TCO), while giving you the performance and flexibility you need to grow your business.

What is the 7000 Sequence?

Manufacturers in many industries use a product-numbering system to differentiate products within a product line or brand. This helps customers compare specific products that offer a variety of different features. The same is true with processors, especially in today's world when so many additional features contribute to performance above and beyond clock speed.

By changing how it identifies components on server platforms, Intel is making it easier for customers to take into account all the things that contribute to their overall experience—including features like architecture, cache, front side bus, and other Intel® technologies.

Intel offers four processor number sequences for server applications.

Processor Sequence	Used For
Intel® Pentium® 4/Pentium® D processor 3000[1] sequence	Small business, entry or first server
Dual-Core Intel® Xeon® processor 5000[1] sequence	Volume DP servers/workstations based on the Intel Xeon processor
Dual-Core Intel® Xeon® processor 7000[1] sequence	Greater scalability with MP enterprise servers based on the Intel Xeon processor MP
Intel® Itanium® 2 processor 9000[1] sequence	Maximum performance and scalability for RISC replacement usage

Processor Number[1]	Description
Intel® Xeon® processor 7041	3.0 GHz 2x2MB L2 800 MHz front-side bus
Intel® Xeon® processor 7040	3.0 GHz 2x2MB L2 667 MHz front-side bus
Intel® Xeon® processor 7030	2.8 GHz 2x1MB L2 800 MHz front-side bus
Intel® Xeon® processor 7020	2.66 GHz 2x1MB L2 667 MHz front-side bus

Architected for Intel Dual-Core processors.

MP platforms based on the Dual-Core Intel Xeon processor 7000 sequence are architected specifically for Intel dual-core processors. Multi-core products are designed by including two or more full processor cores within a single processor, enabling simultaneous management of activities. Plus, each core supports Hyper-Threading Technology[3] (HT Technology), which allows a Dual-Core Intel Xeon processor 7000 sequence to process four software threads simultaneously—a total of 16 threads in a 4-way multi-processor platform!

This new generation of Intel Xeon processor offers an 800 MHz dual-independent system bus, which helps businesses get the most productivity from their applications. In addition, the platform supports quad-channel DDR2-400 memory, which offers increased DIMMs per system for enhanced memory scalability compared to previous-generation MP platforms. DDR2-400 is ideal for data-intensive applications, providing up to a 20% increase in memory bandwidth over DDR1-333 and up to a 40% decrease in power consumption.[4]

The performance, reliability, and flexibility you need.

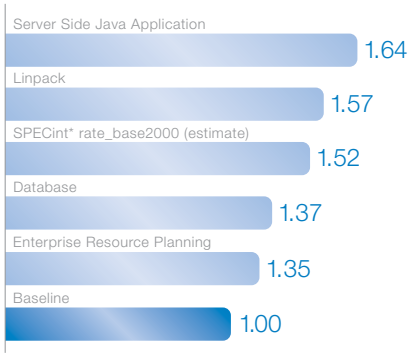
The Dual-Core Intel Xeon processor 7000 sequence helps deliver enhanced platform performance and dependability through a variety of innovative technologies, including the following:

- Fast response times with two processor cores per CPU running at speeds up to 3.0 GHz, each with their own 2MB integrated L2 cache.
- Up to four times the system bus bandwidth of previous-generation Intel Xeon processors MP with a high-speed, 3-load front-side bus with a frequency of 800 MHz.
- Power savings and system density for server applications by using Demand-Based Switching (DBS) with Enhanced Intel SpeedStep® technology.
- Scale bandwidth with PCI Express,* an I/O technology that helps match the performance and capabilities of next-generation serial interconnects.
- Quad-channel DDR2-400 memory-based subsystem offers large memory capacity and low latency, while consuming less power (vs. DDR1 memory technology).
- Reliability with enhanced RAS features including an Error Correcting Code (ECC) bus, memory RAID, and I/O and memory hot-plug.
- SMBus with PIROM and thermal sensor allows for scheduled service in the event of a system manufacturing defect or cooling device failure.

Dual-Core Intel® Xeon® Processor 7000[1] Sequence

Server Platform Performance: Dual-core platform versus prior-generation single-core platform

DUAL-CORE INTEL® XEON® PROCESSOR 7041[1] VS. INTEL® XEON® PROCESSOR MP 3.33 GHZ 8MB L3 CACHE

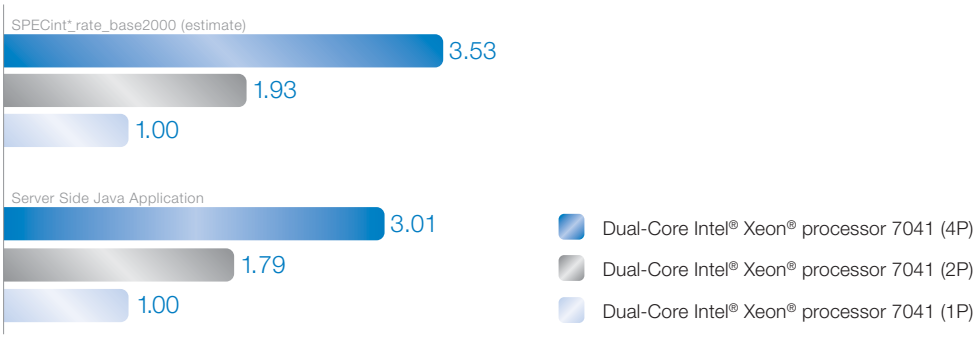


Relative Performance: Higher is Better

Dual-Core Intel® Xeon® Processor 7000[1] Sequence

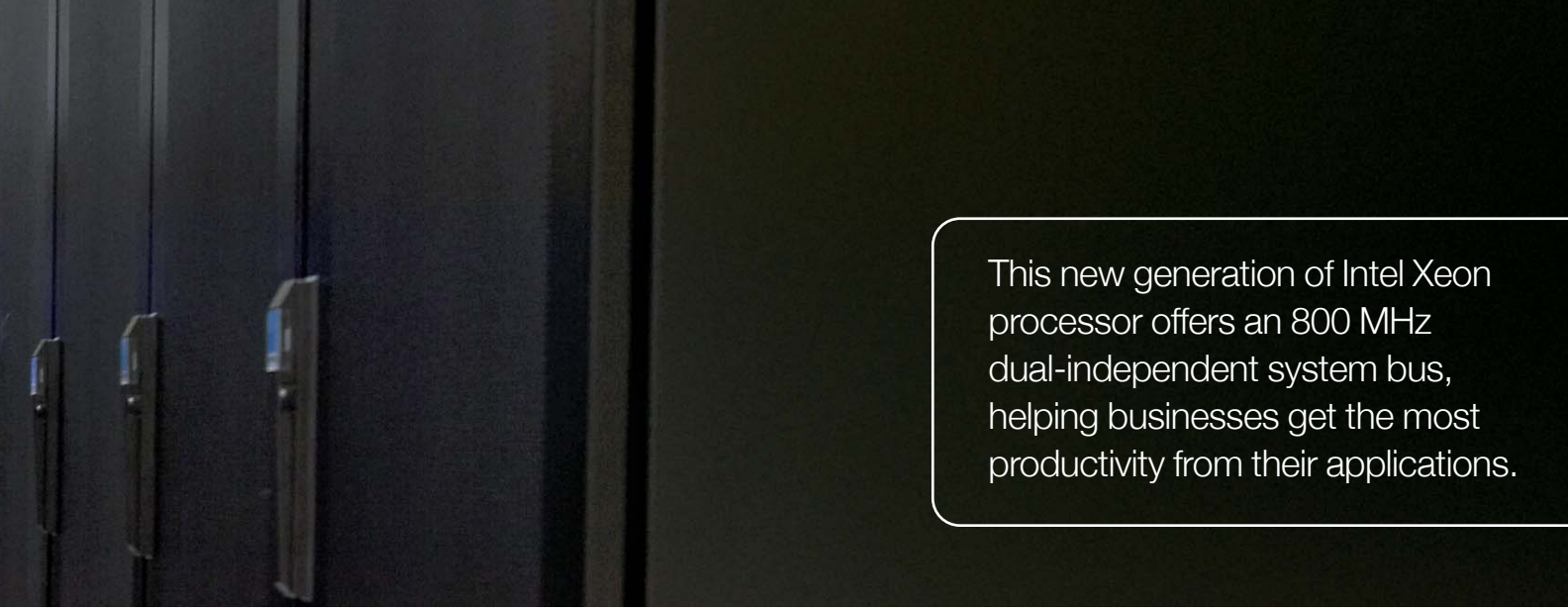
Scalability: Dual-core 1P to 4P scalability versus prior-generation single-core platform

DUAL-CORE INTEL® XEON® PROCESSOR 7041[1] 1P TO 4P SCALING



Relative Performance: Higher is Better

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance.



This new generation of Intel Xeon processor offers an 800 MHz dual-independent system bus, helping businesses get the most productivity from their applications.

Benchmark notes:

Dual-Core Intel® Xeon® Processor 7000 Sequence: Server Platform Performance

SPECint*_rate_base2000. Estimates based on Intel internal measurement (August 2005). Baseline Platform Configuration: Intel® Server System pre-production hardware with four 64-bit Intel® Xeon® Processor MP 3.33 GHz with 8 MB L3 Cache, E8500 Chipset, 667 MHz FSB; 8 GB memory; Hyper Threading ON; Windows* 2003 Enterprise Edition. SPECcpu2000 binaries built with Intel compiler version 8.1 for 32-bit Windows

New Platform configuration: Intel® Server System pre-production hardware with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; 2 GB memory; Hyper Threading OFF; Windows* 2003 Enterprise Edition. SPECcpu2000 binaries built with Intel compiler version 8.1 for 32-bit Windows

Linpack. Baseline Platform configuration: Intel internal measurement - Feb 2005; Intel® Harwich (SR6850HW4) Server Platform with four 64-bit Intel® Xeon® Processor MP 3.33 GHz with 8 MB L3 Cache, E8500 Chipset, 667 MHz FSB; Memory: 16 GB BIOS: SHW40.86B.B10.01.00.0031; HT disabled OS - Red Hat Enterprise Linux* AS release 3 (Taroon Update 3) 2.4.21-20.EL x86_64 GNU/Linux Workload: 5Kx5K through 44Kx44K matrix sizes used; Workload Type: Scalar. Intel Linpack 2.1.2

New Platform configuration: Intel internal measurement - August 2005; Intel® Server System Harwich 800T with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; Memory: 16 GB; HT enabled OS - Red Hat Enterprise Linux* AS release 4 2.6.9-5 EL x86_64 GNU/Linux Workload: 5Kx5K through 40Kx40K matrix sizes used; Workload Type: Scalar. Intel Linpack 2.1.2

Server-Side Java Application. This workload evaluates the performance of Server-side Java Application. Measured in Operations Per Second. Performance estimates based on Intel internal measurement.

Baseline Platform Configuration: Intel® Server System pre-production hardware with four 64-bit Intel® Xeon® Processor MP 3.33 GHz with 8 MB L3 Cache, E8500 Chipset, 667 MHz FSB; 8 GB memory; Hyper Threading ON; HWP and ASP enabled; Windows* 2003 Enterprise Edition. Application Server software: BEA JRockit* JVM for 32-bit Windows

New Platform configuration: Intel® Server System pre-production hardware with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; 2 GB memory; Hyper Threading ON; HWP and ASP disabled; Windows* 2003 Enterprise Edition. Application Server software: BEA JRockit* JVM for 32-bit Windows

Database. Intel internal application which evaluates the capacity of a database server in supporting transaction processing. Simulates execution of user transactions against a database in an order-entry environment. Measured in transactions per second.

Baseline Platform Configuration: Intel® SR6850HW4 Server System, BIOS: SHW40.86B.B13.01.00.0032, with four 64-bit Intel® Xeon® Processor MP 3.33 GHz with 8 MB L3 Cache, E8500 Chipset, 667 MHz FSB; Adjacent Sector Pre-fetch Enabled, Hardware Pre-fetch Disabled, 32 GB Memory. Microsoft Windows* 2003 Enterprise x64 Edition O/S build 1433 (SP1)

New Platform Configuration: Intel® SR6850HW4/M Server System (Harwich 800T), BIOS: SHW40.86B.B24.03.00.0058, with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; Hyper-Threading Enabled, Hardware Pre-fetch Disabled, Adjacent Sector Pre-fetch Disabled, Memory: 32 GB Microsoft Windows* Enterprise Server 2003, SP1-Build 1812, x86 Edition.

Enterprise Resource Planning. Workload emulates a SAP-based Sales and Distribution application and helps ERP. Measured in number of concurrent users supported. Performance estimates based on Intel internal measurement.

Baseline Platform Configuration: Intel Server Platform Harwich with four 64-bit Intel® Xeon® Processor MP 3.33 GHz with 8 MB L3 Cache, E8500 Chipset, 667 MHz FSB BIOS: SHW.86B.B10.01.00.0031, Hyper Threading: Enabled, Hardware Pre-fetch: Enabled, Adjacent Sector Pre-fetch: Enabled, Memory: 32 GB Operating system: SuSE Linux* Enterprise 9 for x86-64 SP2. Linux kernel 2.6.5-191-smp Application server: SAP* R/3 Enterprise v4.7 SR1 for x86-64

New Platform Configuration: Inter Server Platform Harwich 800 with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; BIOS: SHW40 Version 3.00, Hyper Threading: Enabled, Hardware Pre-fetch: disabled, Adjacent Sector Pre-fetch: disabled, Memory: 32 GB Operating system: SuSE Linux* Enterprise 9 for x86-64 SP2. Linux kernel 2.6.5-191-smp Application server: SAP* R/3 Enterprise v4.7 SR1 for x86-64

Dual-Core Intel® Xeon® Processor 7000 Sequence: Server Platform Scalability

SPECint*_rate_base2000. Estimates based on Intel internal measurement (August 2005). Platform configuration: Intel® Server System pre-production hardware with Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; 2 GB memory; Hyper Threading OFF; Windows* 2003 Enterprise Edition. SPECcpu2000 binaries built with Intel compiler version 8.1 for 32-bit Windows. Measurement done in 1, 2 and 4 processor configuration

Server-Side Java Application. Estimates based on Intel internal measurement (August 2005). Platform configuration: Intel® Server System pre-production hardware with four Intel® Xeon® Processors 7041, 3.0 GHz with 2x2MB L2 Cache, E8501 Chipset, 800 MHz FSB; 2 GB memory; Hyper Threading ON; HWP and ASP disabled; Windows* 2003 Enterprise Edition. Application Server software: BEA JRockit* JVM for 32-bit Windows. Measurement done in 1, 2 and 4 processor configuration

Contact

United States and Canada
Intel Corporation
Robert Noyce Building
2200 Mission College Blvd.
P.O. Box 58119
Santa Clara, CA 95052-8119
USA

Europe
Intel Corporation (UK) Ltd.
Pipers Way
Swindon
Wiltshire SN3 1RJ
UK

Asia-Pacific
Intel Semiconductor Ltd.
32/F Two Pacific Place
88 Queensway, Central
Hong Kong, SAR

Japan
Intel Japan (Tsukuba HQ)
5-6
Tokodai Tsukuba-shi
300-2635 Ibaraki-ken
Japan

South America
Intel Semicondutores do Brasil LTDA
Av. Dr. Chucri Zaidan, 940-10° andar
04583-904 São Paulo, SP
Brazil

[1] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See http://www.intel.com/products/processor_number for details.

[2] Performance gains based on Intel internal measurements of Java performance. Baseline Intel Server platform contains four 64-bit Intel® Xeon® Processor MP 3.33 GHz/8M L3 Cache, Intel E8500 chipset, Intel Hyper Threading ON. The new Intel Server pre-production platform contains four Intel Xeon Processor 7041 with E8501 Chipset with Intel Hyper Threading ON. Actual results will vary by hardware and software configuration.

[3] Hyper-Threading Technology requires a computer system with an Intel® Xeon® processor supporting HT Technology and a HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See www.intel.com/homepage/land/hyperthreading_more.htm for additional information.

[4] Based on Intel power testing utilizing Intel® Xeon® processor 3.66 GHz with 667 MHz system bus. Dual-Core Intel Xeon Processor 7041 expected to exhibit similar power consumption characteristics. Actual power savings will vary based on system configuration and workloads.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit http://www.intel.com/performance/resources/limits.htm or call (U.S.) 1-800-628-8686 or 1-916-356-3104.

All dates and products specified are for planning purposes only and are subject to change without notice

Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.

SPECint2000* and SPECfp2000* benchmark tests reflect the performance of the microprocessor, memory architecture and compiler of a computer system on compute-intensive, 32-bit applications. SPEC benchmark tests results for Intel microprocessors are determined using particular, well-configured systems. These results may or may not reflect the relative performance of Intel microprocessor in systems with different hardware or software designs or configurations (including compilers). Buyers should consult other sources of information, including system benchmarks; to evaluate the performance of systems they are considering purchasing.

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